

Hospital beds by design: a socio-historical
account of the 'King's Fund Bed', 1960-1975.

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Abstract

This thesis is an account of the origins and early years of the artefacts known in British hospitals as 'King's Fund Beds'. Launched in the late 1960's, the beds were the result of an elaborate, four-year project run by the King's Fund, a charitable foundation supporting London's hospitals. In 1967 the Fund published a specification for a bedstead 'suitable for widespread use in general hospitals'.

The design work involved was done at London's Royal College of Art. It was led by a proponent of 'Design Methods', a movement concerned with making the process of artefact design more logical and systematic. The movement drew heavily on techniques devised in operational research and subsequently applied to decision making and management in many walks of life. Because practitioners were unusually reflexive, concerned about methods and careful to preserve records of their work however ephemeral, the project offers the opportunity of exploring, in some detail, the processes resulting in the built form of a mass produced artefact for use in a medical context.

Taking the 'King's Fund Bed' as the explanandum, an attempt is made to show how built forms of the bed came to embody not only the theoretical preconceptions and methodological preoccupations of the designers, which were to a large extent rooted in an empiricist,

behaviourist account of 'bed use', but also their own aspirations and the conflicting interests of different professional groups, government departments and manufacturers. The eventual commercial success of the 'King's Fund Bed' is explored in the light of expansionist and centralising policies pursued in the British National Health Service at a time when traditional modes of organisation and social relations still largely prevailed in hospitals.

As a whole, the thesis is an attempt to provide a more broadly based model for case studies of artefacts.

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Acknowledgements

My first debt of gratitude is to The Science Museum, for giving me the opportunity to undertake this study. Secondly, I am grateful to my adviser, William Bynum, for unstinting support and invaluable advice. Special thanks are owed to those whom I interviewed about the King' Fund Bed Project. They gave most generously of their time, even if bemused as to why, nearly forty years on, someone should be so interested in so many long-gone details. Bruce Archer and Kenneth Agnew in particular spent many hours discussing the project.

The staff of the various archives and libraries I have used have been unfailingly helpful, especially those of the Science Museum Library, and of the Archive of Art and Design at the Victoria and Albert Museum. Lastly, I thank all my colleagues and friends, at the Science Museum and elsewhere, with whom I discussed my research. Their support, both intellectual and practical, was central to the enterprise.

This page reserved for illustrations.

Hospital beds by design: a socio-historical account of the 'King's Fund Bed', 1960-1975.¹

Introduction

Detailed case studies of the design of mass-produced medical artefacts are rare. When it comes to writing about objects, medical historians have shown greater concern with typology, invention, innovation and the diffusion and uptake of technologies than with the detailed design of mass-produced artefacts in common use, which may be contingent on factors well beyond the immediate 'medical' context.² Latterly, certainly, the design

¹Strictly speaking, there was no such thing as a 'King's Fund Bed'. The King's Fund published a specification. Manufacturers whose beds met it were allowed to use the term added to their company name, as in, for example, 'Nesbit-Evans King's Fund Bed'. In time the term 'King's Fund Bed' came into common parlance in hospitals to mean any bed which met the specification and I shall use it throughout in this sense unless qualification is required.

²Typology has long been a central concern of those writing about instruments in medicine. See for example V. Møller-Christensen, *The History of the Forceps*, London, Oxford University Press, 1938. More recent studies have explored the relation of theory and practice to the invention and use of particular diagnostic or therapeutic technologies. Examples include Joel Howell, *Technology in the hospital: transforming patient care in the early twentieth century*, Baltimore, Johns Hopkins University Press, 1995, and J. P. Baker, *The machine in the nursery: incubator technology and the origins of newborn intensive care*, Baltimore, Johns Hopkins University Press, 1996. Both the above genres are concerned with changes in instrumental design only in so far as they overtly relate to changing medical theory and practice (whatever the dynamic of this relationship is held to be). For this purpose, prototypes and 'firsts' are of more concern than 'late' production models. Design choices embodied in such production models which do not relate directly to medical 'function' are excluded from consideration. For example, many of the technologies in the case studies by Howell and Baker are now mass-produced with sheet metal housing (as of course are many pieces of non-medical equipment), but neither of the authors discusses this.

of large technological systems in the medical field has been related to the industrial context.³ But case studies of single artefact design present rather different challenges. Although the explanatory factors invoked may, some would say must, be similar, it appears harder to expose, say, the workings of power and interest in the articulation of a braking system, or the adjustments of a bedstead, than in the location of electricity stations on a grid or the voltages adopted for common usage: harder perhaps, but not impossible.

Why study artefacts at all? For at least three decades, historians of medicine and science have occasionally lamented the failure of their colleagues to 'use artefacts'. Although often described as invaluable resources, in practice artefacts have been the Cinderella source in historical studies of literate societies. Not surprisingly, much of the complaint about this state of affairs has come from those who maintain, or are maintained by, collections of historical artefacts.⁴ Despite the obviously situated nature of these claims for the special relevance of artefacts, it seems reasonable to explore how current historical work might usefully focus on them. How might they be incorporated into the array of analytical modes, tools and sources utilised by historians of various persuasions?

Part of the problem indeed seems to lie in the undue promotion of

³ See for example S. Blume, *Insight and Industry: On the Dynamics of Technological Change in Medicine*, Cambridge, Mass., The MIT Press, 1992, a study of the growth of the medical imaging industry around the new technologies of CT scanning, ultrasound and magnetic resonance imaging.

⁴ For a recent example see James Edmonson, *American Surgical Instruments*, San Francisco, Norman Publishing, 1997. Edmonson is curator of the Dittrick Museum of Medical History, Cleveland, Ohio.

artefacts as historical sources, as explanans rather than explananda. Compared to written sources, artefacts are deeply ambiguous.⁵ This is not to ignore the huge expansion in textual analysis, the 'linguistic turn' in cultural studies generally that has both problematised and enriched studies of the written word. But for many historical purposes written accounts, treated with due circumspection, are directly useful without extended analysis. This is rarely the case with artefacts. The ambiguity, connotation and signifying that occurs 'above and beyond' what it is the author of a text intended to say is mirrored in full measure by what goes on 'above and beyond' what an object is expressly designed and used for, and the artefact has no direct notational purpose.

Until recently, an extremely limited definition of function has been employed in much writing on the history of technology. As Buchiarelli points out, a chair is 'more than the physics of the device'.⁶ A broader perspective on function has contributed in large measure to some of the more recent work in science and technology studies which problematises the distinction between artefacts and human actors, or elides it altogether.⁷ The history of technology is an obvious resource for the study of artefacts but has been curiously neglected by many of those writing about medical

⁵ G.M. Lawrence, 'The ambiguous artefact: surgical instruments and the surgical past', in Christopher Lawrence (ed), *Medical Theory, Surgical Practice*, London, Routledge, 1992, pp.295-314.

⁶ Louis L. Buchiarelli, *Designing engineers*, Cambridge, Mass., MIT Press, 1994, p.6 (1996 edn).

⁷ See for example Madeleine Akrich, 'The De-Description of Technical Objects' in W.E.Bijker and John Law (eds), *Shaping Technology/Building Society: Studies in Sociotechnical Change*, Cambridge, Mass., MIT Press, 1992, pp.205-224.

and scientific objects. Perhaps one reason lies in the fact that in this discourse the emphasis is now very much on the technological object as explanandum, rather than explanans. (It is indeed hard to see how artefacts might ever have been adequate sources for *a history of themselves*, unless an avowedly technological determinist position is adopted.) A concern with the highly situated and contingent nature of technological change, and the detail of 'thick description' needed to explore these issues, has turned historians of technology to case studies rather than surveys and overviews.⁸ This thesis is a case study, inevitably with somewhat arbitrary boundaries. The lines between object and 'non object', artefact and 'context', immediate and wider contingent circumstances could have been drawn differently. The limits of a case study are not easy to define.

To an extent, mine have been determined by sources. The paucity of detailed single artefact studies is in part attributable to the lack of adequate source material. Notoriously, some stages in the design of certain artefacts are rarely articulated, let alone recorded. This is a commonplace among historians dealing with production processes akin to 'craft', but probably holds good for many areas of design and technology.⁹

⁸ See Wiebe Bijker, Thomas P. Hughes and Trevor Pinch (eds), *The Social Construction of Technological Systems*, Cambridge, Mass., The MIT Press, 1987, p.5 for a discussion of a new emphasis in areas of technology studies with theoretical aims on 'thick description', that is on 'a wealth of information about the technical, social, political and economic aspects of the case under study'.

⁹ G. Sturt, *The Wheelwright's Shop*, Cambridge University Press, 1934, is the classic account cited by historians of technology and design as a rare attempt by a craftsman to document a craft practice before it ceased to exist. On the difficulties of studying craft practices in the history of technology, see A. Pacey, 'The History of Technology', in P. Corsi and P. Weindling (eds), *Information Sources in the History of Science and Medicine*, London, Butterworths, 1983, pp.44-60:50.

For industrially produced artefacts, where records must have existed, they are seldom preserved. Engineering drawings, company meeting minutes, sales records and customer complaints do not often survive in quantity for individual products, certainly in the medical field.¹⁰ For the 1960's artefact that is the subject of this thesis, however, extensive archival material does exist. The 'King's Fund Bed' was the result of a project to devise a specification for a bedstead 'suitable for widespread use in general hospitals' which was meticulously documented at the time.¹¹ Indeed analysis of, and reflexivity about, the design process were as important to some of those involved as the resulting specification. For the project was as much about design as it was about beds. The King's Fund Bed was both test case and advocate for a new method of designing artefacts that was to replace unexamined intuition with overt, systematic and logical procedure, in fields ranging from product engineering and industrial design to architecture and town planning.

Like many 1960's initiatives, systematic design methods were rejected and repudiated by many almost as quickly as they had been embraced.¹² By the late 1970's what had become known as the Design

¹⁰ In the medical equipment field, the mergers and take overs which have changed the situation from that obtaining in the post-war years, where numerous medium to small concerns existed, to the present one where a few large multinational companies dominate, have resulted in successive losses of such archives as had been maintained.

¹¹ *Design of Hospital Bedsteads*, King Edward's Hospital Fund for London, 1967, p.12.

¹² Bernard Levin characterises the decade as one when it was 'never easier to gain a reputation as a seer, never was a following so rapidly and readily acquired . . . however temporary their adherence might prove.' Bernard Levin, *The pendulum years: Britain and the sixties*, London, Jonathan Cape Ltd., 1970. p.9. For other accounts of the post-war decades in Britain, see Kenneth Morgan, *The People's Peace: British History, 1945-1989*, Oxford, Oxford University Press, 1990, and Alan Sked and Chris Cook, *Post-war Britain: a political history*, Harmondsworth, Penguin Books, 1979 (2nd edn.1984).

Methods movement was, according to some commentators, in 'terminal decline', and 'in the intellectual climate of post-modernism became so passé as to be almost written out of history.'¹³ The King's Fund Bed, however, went on, and on. British manufacturers still sell it today. The assumption that the success of the bed, in terms of its widespread adoption, was related straightforwardly to the method of its design is one which will be examined closely in this thesis. For the Ministry of Health (from 1968 the Department of Health and Social Security), the ultimate general acceptance of King's Fund Beds in hospitals represented success in a rather separate endeavour. The introduction of a standard design for a high profile artefact in the National Health Service, at a time when consultants and hospital administrators alike were still wary of increasing centralisation, was no small matter, and had considerable economic implications.

Sources

As indicated above, the archival sources for the King's Fund Bed project are relatively rich. King Edward's Hospital Fund for London was established in 1897 to provide financial support for London's voluntary hospitals.¹⁴ Its archives are deposited in the London Metropolitan Archives.

¹³ Andrew King, review of C.T. Mitchell, 'Redefining Designing', Van Nostrand Reinhold, 1993, *Journal of Design History*, 7, no 1, 1994, pp.61-63:63.

¹⁴ For a history of the Fund see Frank Prochaska, *Philanthropy and the Hospitals of London: The King's Fund, 1897-1990*, Oxford, Clarendon Press, 1992. It was known until 1902 as 'The Prince of Wales Hospital Fund for London to Commemorate the 60th year of the

They include the Minutes of the Working Party on Hospital Bedsteads together with the considerable amount of correspondence, memoranda, meeting notes and ephemera generated by the project. I have made extensive use of these, together with Minutes of the Fund's Management, Hospital Services and Hospital Centre Committees where appropriate.

The paperwork of the Department of Design Research (and its various precursors) at London's Royal College of Art, where the King's Fund Bed specification was drawn up, and all the design work for prototypes carried out, was hastily deposited in the Victoria and Albert Museum's Archive of Art and Design in the late 1980's. This followed the closure of the Department in the reorganizations of the College's new Rector, Jocelyn Stevens, appointed in 1984.¹⁵ The material includes the project files, together with those of related projects from which design solutions were 'borrowed', and administrative and policy files of the Department. Since the staff were instructed never to throw away so much as a scribbled note or sketch, this archive is very extensive indeed and was fully maintained as a resource during the life of the Department.¹⁶ The hasty manner in which it had to be deposited, however, has sometimes made subsequent access problematic in the absence of a complete catalogue.

Ministry of Health and DHSS archives relating to the project are

Queen's Reign'. In the mid-1960s the charity became known officially as 'The King's Fund'.

¹⁵ C. Frayling, *The Royal College of Art: 150 Years of Art and Design*, London, Barrie and Jenkins Ltd, 1987, p.198.

¹⁶ Interview, Kenneth Agnew, 22.6.00

relatively sparse. Files from the Supplies Division of the Ministry, which dealt directly with the project, and whose Controller sat on the King's Fund Working Party on Hospital Bedsteads, were among the last to become available at the Public Record Office for the period in question.¹⁷ When they could be consulted, in the Spring of 2000, it was disappointing that none of the files directly relating to this relatively high profile project appeared to have been preserved. Not unexpectedly, the overall quantity of material selected for preservation from the Supplies Division, together with other less 'glamorous' areas such as engineering, was far less than that retained from general policy files. While this is understandable, it underlines some of the difficulties faced by historians of technology, particularly in the field of mass-produced and relatively mundane items. It might be noted in passing that the amount of taxpayer's money spent annually by NHS supplies officers in the early 1960's was 'more than what is spent on the whole of the universities of Great Britain, including buildings and staff, more than is spent on law and order, the police, courts, and prisons.'¹⁸

Ministry of Health files relating to wider issues, such as equipment standardisation and contracting arrangements in the NHS, do survive however, and proved particularly useful in tracing the history of changing policy on supply from the outset of the Service.¹⁹ This area is largely

¹⁷ File Series MH136.

¹⁸ Sir Bruce Fraser, Permanent Secretary, MOH, to a meeting of the Supplies Officers Association in 1963. *British Hospital and Social Service Journal*, June 7, 1963, p.676.

¹⁹ MH136/11, MH136/13, MH136/17.

neglected in secondary sources.²⁰ Other archives holding small amounts of material relevant to the project or its protagonists include those of the Royal College of Art itself, the Royal College of Nursing Archives at Edinburgh, the archives of Chase Farm Hospital on the outskirts of North London where prototype bedsteads were trialled, and the BBC Archives at Caversham.

Beyond these archival sources this thesis also relies on interviews conducted with some twelve individuals who participated in the King's Fund Bed project, whose working lives were affected by it or who were employed in the Ministry of Health or the bed making industry at the time. A list of these interviewees, together with brief biographical details, is provided as an appendix. Although this is not an oral history project per se (in that the interviews are merely one among several evidential sources) I have referred to recent works on the genre with a view to acquiring, I hope, the necessary circumspection when dealing with this kind of evidence. *Oral History, an Interdisciplinary Anthology*, edited by David Dunaway and Willa Baum, includes the useful essay, *Theory, method and oral history* by Peter Friedlander.²¹ There is a clear spectrum of practice between the more sociologically orientated historical methods which seek out the participant account precisely because it is a situated one, and may analyse not only

²⁰ Webster's official history of the health services alludes to the four reports on the organisation of the hospital supplies service since 1948 in a single footnote. They were the Messer Report of 1958, the Hunt Report of 1966, the Collier Report of 1976, and the Salmon Report of 1978. Charles Webster, *The Health Services Since the War*, London, HMSO, 1996, Vol II, p.936.

²¹ Peter Friedlander, 'Theory, Method and Oral History', in David K. Dunaway and Willa K. Baum (eds), *Oral History: An Interdisciplinary Anthology*, Walnut Creek, Altamira Press, 1996, pp.150-160.

content but the interview situation itself, and more traditional studies which anticipate that oral history will be straightforwardly revealing of 'what really happened'.

In terms of secondary literature I have had to consult material from widely differing disciplines and disciplinary histories. A full account of the King's Fund Bed project involves the history of the National Health Service, hospital building, administration and supply, nursing, design and manufacturing in Britain, the history of the human sciences and of the so-called 'cyborg' sciences²².

For the political and economic dimensions of the hospital service in the post-war decades, Webster's official history of the health services in Britain is invaluable, together with his shorter history of the NHS, and the volumes by Geoffrey Rivett and Gordon Macpherson provide additional 'insider' perspectives.²³ A rich source for the relatively understudied area of hospital administration has been the professional journals, in particular the *British Hospital and Social Service Journal*.²⁴ This, a principal journal for hospital managers (and, until the mid 1970's, social workers) contains a wealth of material in the form of editorials, articles (authored by supplies officers and engineers as well as administrators) and advertisements,

²²The term 'cyborg sciences' is used by Andy Pickering, see below.

²³Webster, op. cit note 21, also Charles Webster, *The National Health Service: a political history*, Oxford, Oxford University Press, 1998, Geoffrey Rivett, *From Cradle to Grave: Fifty Years of the NHS*, London, King's Fund, 1998, Gordon Macpherson (ed), *Our NHS: A celebration of fifty years*, London, BMJ Books, 1998.

²⁴The *British Hospital and Social Service Journal* continued as the *British Hospital Journal and Social Service Review* from February 1965, then as the *Health and Social Service Journal* from 1972. After 1976 it was known as the *Health Service Journal*.

providing insight into the concerns of this key group of hospital staff. For nursing, secondary sources are less sparse. The work of Christopher Maggs has included reflection on the historiography, as well as the history, of nursing.²⁵ There remains however a dearth of material covering ward practice in recent decades. Here nursing textbooks and the procedural manuals of individual hospitals are a double-edged resource; not to be relied on as accounts of actual practice, they yet represent the official line to which designers were required to tailor their products.

Design history has established itself relatively recently as a reflexive discipline, as evidenced by primers with titles such as *Design History and the History of Design*, described on its publication in 1989 as 'the first explicitly theoretical examination of the subject'.²⁶ Nevertheless, for the British context, useful bibliographies such as A. J. Coulson's *A Bibliography of Design in Britain, 1851-1970*, were published prior to this, as was a fairly small amount of insightful work on the history of industrial design and the industrial designer, such as Penny Sparke's *Consultant Design: the History and Practice of the Designer in Industry*.²⁷ The low status of industrial designers in Britain until the 1960's, the involvement of

²⁵ See Christopher Maggs (ed) *Nursing History: The State of the Art*, London, Croom Helm, 1987, and Christopher Maggs, *Sources for the History of Nursing in Great Britain*, London, King's Fund Publishing, 1984.

²⁶ John A. Walker, *Design History and the History of Design*, London, Pluto Press, 1989.

²⁷ A. J. Coulson, *A Bibliography of Design in Britain, 1851-1970*, London, Design Council, 1979. Penny Sparke, *Consultant Design: The History and Practice of the Designer in Industry*, London, Pembrooke Press, 1983. See also Jonathan Woodham, *The Industrial Designer and the Public*, London, Pembrooke Press, 1983, and the useful bibliographic essay, 'Notes on the Historiography of Design' in Carlo Pirovano (ed), *A History of Industrial Design* vol 3, 1919-1990, Milan, Electa, pp.404-413.

industrial design with the market place, and the general poverty of theory in British design have been prominent themes.

There is a vast literature on the history of the human sciences. As an overview, I have found Roger Smith's *Fontana History of the Human Sciences* particularly helpful, together with reflections on the writing of this volume and the origins of the term 'human sciences'.²⁸ It was from the variously differentiated disciplines of psychology, applied psychology, social psychology and sociology that theory and methods were borrowed by those who, in the post-war years, sought to apply the approach of the natural sciences to ever-widening areas of practical human activity. On methodology per se in the social sciences, and, importantly, its relation to practice, nothing comparable to Jennifer Platt's history of sociological research methods in America exists for the British situation, but given the US domination of the field in the post-war years this volume still proved an insightful guide.²⁹

Histories of operational research (or, in the United States, operations research) consist in large measure of internalist participant accounts which celebrate war-time achievements and/or promote peace-time applications.³⁰ Rather few critical or analytical studies of the

²⁸ Roger Smith, *A history of the human sciences*, London, Fontana, 1997. See also his article 'History and the history of the human sciences: what voice?', *History of the Human Sciences*, 10, No 3, 1997, pp.23-39 and John Christie, 'The human sciences: origins and histories', *History of the Human Sciences*, 6, No 1, pp.1-12.

²⁹ Jennifer Platt, *A history of sociological research methods in America, 1920-1960*, Cambridge University Press, 1996.

³⁰ For a typical account see the opening chapter, 'The evolution of an attitude' in Patrick Rivett, *Concepts of Operational Research*, London, C.A. Watts and Co Ltd., 1968, pp.1-13.

phenomenon exist. An important exception lies in recent work by economic historians who have highlighted the close links between notions of optimisation in operational research and maximisation of value or utility in economic theory. Many of these authors attended a conference at Erasmus University, Rotterdam, in 1999 entitled *Economists at War*. The (intended) emphasis was on the Cold War, but the collected papers (as yet unpublished) comprise a sophisticated antidote to the 'Boy's Own' history provided by participants in operational research. In particular, Philip Mirowski's paper provides an exploration of how operational research has been constituted in the U.S. and Britain, as well as being a valuable bibliographical resource for its history.³¹

Further insights into operational research come from historians of science who have studied that group of disciplines which Andy Pickering calls the 'cyborg sciences', in contradistinction to the 'traditional' social sciences.³² The cyborg sciences 'elided the difference between people and things'. Pickering's 'incomplete list' of cyborg sciences comprises operations research, systems dynamics, general systems theory, cybernetics, cellular automata, self-organisation, game theory, artificial intelligence, neural networks and information theory. Notwithstanding

³¹ Philip Mirowski, *RAND/OR: How Operations Research put the Rigor in the Mortis*, unpublished typescript, 1999. See also 'Cyborg Agonistes: Economics meets O.R. in mid-century', *Social Studies of Science*, 129, 5, October 1999, pp.685-718.

³² Andy Pickering, *Units of analysis: Notes on World War II as a discontinuity in the social and cyborg sciences*, unpublished typescript, 1999. See also Andy Pickering, 'Cyborg History and the World War II Regime', *Perspectives on Science*, 3, 1995, pp.1-48, and Andy Pickering, 'History of Economics and the History of Agency', in J.Henderson (ed), *The State of the History of Economics, Proceedings of the History of Economics Society*, London, Routledge, 1997, pp.6-18.

debates about what it actually was, operational research is often included under this umbrella, either as a discipline in its own right or as some sort of general precursor of more extensive attempts to apply the sciences of information and control to society. Both Pickering and Donna Haraway have looked specifically at sciences in the post-war era to which the relationships and analogies between machines, humans or societies were central. Pickering has examined the disciplinary history of the cyborg sciences, or perhaps more accurately the lack of it, as they faced 'the old problem of social reproduction: where was the next generation of cyborg scientists to come from?'³³ This has connections with a large body of work on artificial intelligence into which I have not ventured. Haraway has focused on biology, and the transformation of central areas of that discipline 'from a discourse on physiology . . . to a discourse on cybernetic technological systems', with the post-war creation of sociobiology as 'an engineering-humanist discourse theorizing about society as a design problem in information exchange and control'.³⁴ Apart from these broadly based analyses, which are of relevance to understanding why the designers of a hospital bed in Britain in the 1960's should have had recourse to methods borrowed from operational research, there is also recent historical work on cybernetics, that quintessential 'cyborg' science.³⁵

³³Pickering, *Units of analysis*, 1999, p.6.

³⁴Donna Haraway, 'The high cost of information in post-World War II evolutionary biology: ergonomics, semiotics, and the sociobiology of communications systems.', *The Philosophical Forum*, XIII, Nos 2-3, 1981-2, pp.244-278: 245, 247.

³⁵Steve Heims, *Constructing a social science for Postwar America: The Cybernetics Group, 1946-1953.*, Cambridge, Mass., The MIT Press, 1993.

Post-war 'management science' however, perhaps the most direct descendant of operational research, still lacks a full historical account. This is in contrast to the number of studies which address pre-war Taylorism and time and motion studies. A few works, such as that by Urwick and Brech, are relevant but again the emphasis is on the U.S.³⁶ Critiques from the left are to be found in Doray, and in the *Radical Science Journal*, and concentrate largely on the effects on workers.³⁷

Structure

In addition to this introduction, the thesis comprises six chapters. In Chapter One I describe the circumstances leading to the setting up of a working party on the design of hospital bedsteads by the King's Fund in 1963 and introduce the concerns of the main protagonists from the Fund, the Royal College of Art and the Ministry of Health. Chapter Two outlines the design methods which the leader of the RCA team espoused, their relation to changing trends in design methodology generally and their links with widespread attempts to apply the methods of the natural sciences to areas of practical human activity previously considered beyond their remit.

³⁶ Lyndall Urwick and E.F.L. Brech, *The Making of Scientific Management*, 2, London, Pittman, 1953. On the difference between the British and the U.S. situation, and the relation of Taylorism to the post-war scientific management movement, see Kevin Whitston, 'The Reception of Scientific Management by British Engineers, 1890-1914', *Business History Review*, 71, Summer 1997, pp.207-229. Whitston goes well beyond the time period given in his title.

³⁷ Bernard Doray, *From Taylorism to Fordism: A rational madness*, Free Association Books, London, 1988 and *Scientism and the Left: Radical Science*, 13, 1984.

Chapter Three deals with the main events of the project as it was implemented at the RCA and The King's Fund from June 1963 until February 1967, when the final specification was published by the Fund. It covers the drafting of specifications, the construction of models and prototypes and the production of twenty hospital beds to the RCA's design for trialling in a district general hospital. Chapters Four and Five deal with 'real beds', that is beds produced to the King's Fund specification on a commercial basis after it was finally published in 1967. Chapter Four deals with industry and commerce, Chapter Five with purchasing and use. In the concluding chapter I address the issue of the success of the King's Fund Bed as a means of unpicking some of the implications that the circumstances and methods surrounding its design had for its specification and early built forms. Clearly the notion of success begs the question of 'for whom', and requires further definition.

There are two obvious initial contexts in which to situate the project: hospitals under the National Health Service circa 1960, and British industrial design at the same period. The rest of this introduction is taken up with brief outlines of these contexts, which will be enlarged on in the main text.

The hospital context³⁸

The early 1960's saw an ongoing review of the first decade of the National

³⁸This outline relies largely on the sources in note 24.

Health Service.³⁹ Several large scale initiatives, in particular the Ten Year Hospital Plan, created a climate of expansion and increased resources.⁴⁰ Only five new hospitals were built between 1945 and 1964; the Hospital Plan of 1962 specified '90 new and 134 substantially remodelled hospitals to be started by 1970-71'. Capital expenditure of £200 million for 1961-65/66, and £300 million for 1966-70/71 was assumed.⁴¹ Hand in hand with increased financial allocation, however, went increased attention to cost monitoring and the better use of resources in the light of rising expenditure on the NHS during the 1950's. But for some key issues, finance was not the major problem. New hospital building led to scrutiny of ward design and nursing complements. The perceived shortage of nurses that had beset the NHS from the beginning persisted during the 1960's. Against this background, a constant round of committees and review bodies debated the proper role, remuneration, training, status and organisation of nurses.⁴²

In organisational terms, the original structure of the NHS was still in place. Hospitals operated largely independently of local authority health services and the general practitioners. Their basic administrative structure remained the Regional Hospital Boards (RHBs) to whom Hospital

³⁹ The period 1948-64 has been characterised as one of 'resource starvation and policy neglect', Webster, *The National Health Service*, p.30. The Guillebaud Report of 1956 failed to substantiate suspicions of wasteful overspending, suggesting that more, rather than less, resources were required.

⁴⁰ *A Hospital Plan for England and Wales*, (Cmnd 1604), HMSO, 1962.

⁴¹ *Ibid*, p 13.

⁴² Webster, *The Health Services since the War*, pp.18-19, 170-177, 437-441, Rivett, *From Cradle to Grave*, pp.102-109, 186-191.

Management Committees (HMCs), performing the day to day management of groups of hospitals in a district, were responsible.⁴³ The teaching hospitals had retained their own Boards of Governors and a greater measure of autonomy. But the 1960's saw intense debate as to the proper form of internal administration for hospitals, in terms of structure, personnel and methods. The older style, pre-NHS lay management had persisted through the medium of the Hospital Management Committees but the influence of these Committees had declined since 1948. They were increasingly dominated by the Regional Hospital Boards. As development money flowed, the power of the RHBs grew.⁴⁴ And both lay governance, and the old-style hospital administration, were challenged by protagonists of a new 'scientific' management, fast gaining ground in commerce and industry.

Within medicine itself, professional interests and allegiances were changing as hospital practice became fragmented into increasing numbers of new specialties. These included those building on new technologies, such as cardiac surgery and radiotherapy, and those which were centred on newly identified areas of need, such as geriatrics and paediatrics. As well as the creation of new specialities, the 1950's saw the extension of specialist care to new geographical locations. At the inception of the NHS, planners had given prominence to the fact that consultant services were unavailable in parts of the country distant from the metropolis or a major

⁴³ Fourteen Regional Hospital Boards were created at the outset of the NHS. Wessex RHB was created in 1959, and a separate RHB for Wales in 1974. Rivett, *From Cradle to Grave*, p.29.

⁴⁴ Rivett, *From Cradle to Grave*, p.172.

city. There had been roughly 4,500 consultants in 1948; by 1960 there were around 7000.⁴⁵ Many of the new posts were created, not in traditional areas of medicine and surgery, but in specialties such as anaesthetics, psychiatry, pathology and, later, geriatrics. Against this trend towards wider geographical availability of specialist care, increasing levels of specialisation in high technology areas were soon considered by the profession to warrant their concentration in 'centres of excellence', or at least where minimum standards of resourcing could be guaranteed.⁴⁶ While the burden, or perhaps opportunity, of policing qualifications and training needs was shouldered by the professions, these changes in service provision had considerable implication for planners and administrators at most levels in the NHS. In particular, the intention to centre the hospital service on the concept of the District General Hospital, a 600-800 bed unit providing consultant services in all major specialties, with psychiatric and geriatric units on site and greatly expanded out-patient facilities, brought these issues to the fore.⁴⁷

Factors such as these shaped both the context for development and the intended context of use for new artefacts in British hospitals in the 1960's. It is in these contexts that much material for what has been termed 'thick description' for accounts of the King's Fund Bed will be found. But the hospital context alone is not the only one in which the King's Fund Bed

⁴⁵ Rivett, *From Cradle to Grave*, p.137.

⁴⁶ Cardiac surgery, for example, and the treatment of major accidents, were regarded as requiring special units of this kind.

⁴⁷ *The District General Hospital*, HMSO, 1961.

may be situated. As noted above, the project was as much about design as it was about beds.

British Industrial Design, circa 1960

For much of the twentieth century, British industry had remained committed to 'an anonymous staff designer who received little or no public recognition'. The situation described in 1931, whereby the designer was understood by the manufacturer to be somebody who was going to earn a very moderate wage all his life '.. not.. as much as a dentist, or a lawyer, or a doctor . . . the journeyman in industry and . . . treated as such' was largely unchanged in the post-war years, despite the rise of the consultant designer in the United States.⁴⁸ A very small number of industrial design consultants on the American model existed in London in the 1950's. A very few large manufacturing companies had employed resident designers before the war, but this was far from the norm.⁴⁹ In any case, after the war much of British manufacturing was still in the hands of small to medium sized firms. If a 'designer' was to be found in such concerns, he was likely to be a single draughtsman preparing drawings for the workshop. This was

⁴⁸Penny Sparke, 'Great Britain: Eclecticism, Empiricism and Anti-Industrial Culture' in Carlo Pirovano (ed), *A History of Industrial Design, vol 3, 1919-1990*, Milan, Electa, 1992, pp.182-197:182.

⁴⁹The moulding division of British Industrial Plastics appointed a staff designer in 1931. This was almost unheard of except in the decorative art industries such as textiles and wallpaper. John Vale, 'Designing for Moulded Plastics in the Post-War Period', N. Hamilton (ed), *From Spitfire to Microchip: Studies in the History of Design from 1945*, London, Design Council, 1985, pp.67-71:67.

certainly the prevailing situation in the medical equipment field.⁵⁰

The post-war decades saw rising consumption not matched by growth in manufacturing, together with the loss of traditional colonial markets. Concern over Britain's failing exports fuelled new initiatives to promote design, such as the *Britain Can Make It* exhibition at the Victoria and Albert Museum in 1946, and the formation of the Council of Industrial Design in 1944.⁵¹ The precursor of the Council was the Design and Industries Association, in existence since 1915 in order to 'encourage a more intelligent demand among the public for what is best and soundest in design'. *The Times* approved: 'entirely practical . . . not vaguely artistic'.⁵² The close connection of industrial design with commerce and utility perhaps made practitioners particularly susceptible to an overall conservatism which characterised the mainstream of British design for much of the twentieth century. Numerous commentators have identified this tendency, together with the lack of any theoretical underpinning after the decline of the Arts and Crafts movement of the late nineteenth century.⁵³ Such theoretical writing that was produced largely strove to situate British design in relation to the Modernist movement, and the British version of Modernism lacked the political radicalism of its European

⁵⁰ Interview, Peter Siddall, 19.6.00.

⁵¹ Raymond Plummer, 'Fitness for Purpose: the Story of the DIA.', N. Hamilton (ed), *Design and Industry: The effects of industrial design and technological change on design*, London, Design Council, 1980, pp. 5-11.

⁵² *Ibid*, p.5.

⁵³ See for example Sparke, 'Great Britain: Eclecticism, Empiricism and Anti-Industrial Culture' p.182.

counterpart. There was no British equivalent to the Bauhaus, or its successor at Ulm, where the purpose was 'to establish as one entity professional ability, cultural design and political responsibility'.⁵⁴ This theoretical vacuum was a matter of frustration to some but also of opportunity. The proper source of design theory was not at all obvious, and there were some surprising contenders. When increasing numbers of industrial design courses had been set up by the end of the 1960's, entrants might find themselves studying

. . . synergetics, general systems theory, theory of games, chemistry and physics, topology and projective geometry, cybernetics, communications, meteorology, geology, biology, science of energy, political geography, ergonomics and production engineering, (and/or) sociology, anthropology, psychology (perception, human engineering factors, ergonomics) and, in fact, all the behavioural sciences . . .⁵⁵

⁵⁴ Kenneth Frampton, 'The Ideology of a Curriculum' in Herbert Lindinger, *Ulm Design: The Morality of Objects*, Berlin, Ernst and Sohn, 1990, pp.130-143:131.

⁵⁵ Misha Black, 'Engineering and Industrial Design', *Proceedings of the Institution of Mechanical Engineers*, 186, 74/72, 1972, pp.897-912:908, quoting R.Buckminster Fuller and V. Papanek.